

Watershed Monitoring Strategy Fort Benning, Georgia



UNITED STATES ARMY PUBLIC HEALTH COMMAND (Provisional)

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Briefing Outline

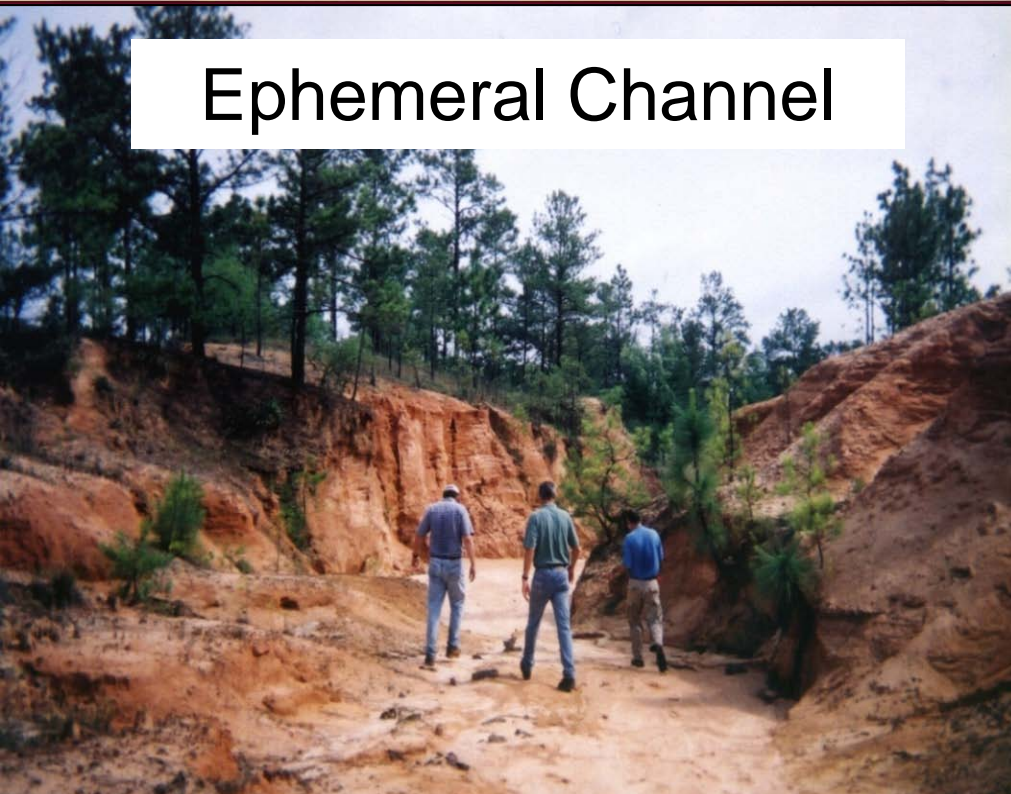
1. Historical Issue
2. Recent Developments
3. New Challenge
4. Project Drivers
5. Solution
 - Conventional Monitoring
 - TMDL Monitoring
 - Visual Observation Monitoring
 - Computer Modeling
 - Stream Geomorphic Assessment
6. Costs

Take Away Message: Installation-wide watershed monitoring strategy that meets compliance and sustainability requirements

Historical Issue

SOIL EROSION AND STREAM SEDIMENTATION

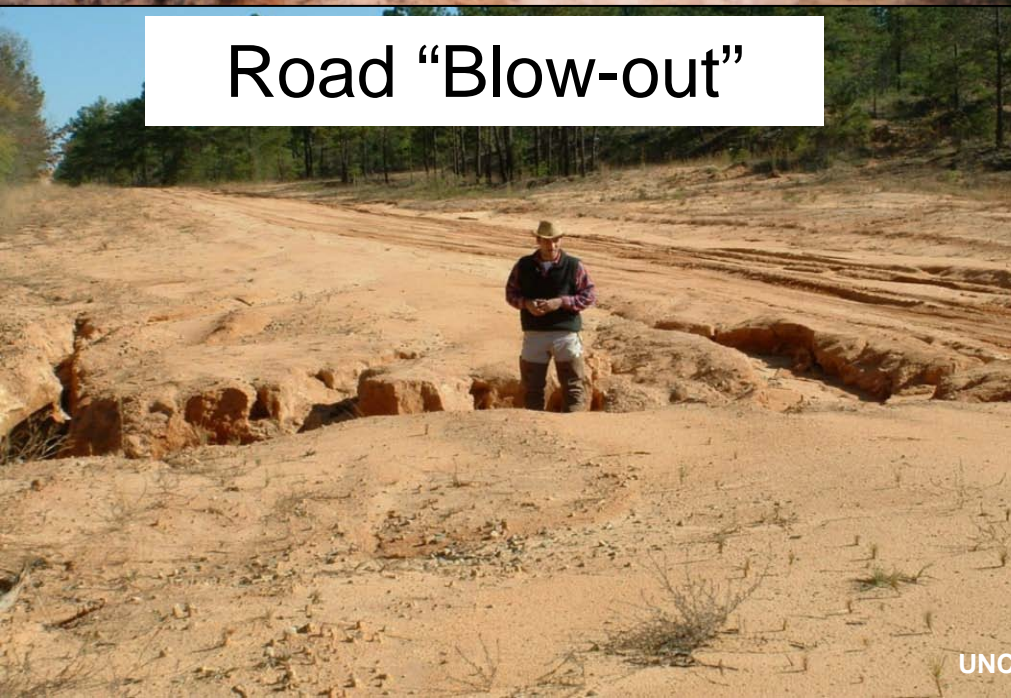
Ephemeral Channel



Ephemeral Channel



Road "Blow-out"



Overland Flow



Recent Developments

Developments:

BRAC (2005)

MCOE (armor)

Army Transformation Actions

Result:

>100 construction projects

>19,000 acres potentially disturbed

>16,000 new soldiers and civilians

New Challenge

**Support existing + new training mission
while maintaining
near-term (present - 2014)
and
long term (2014 - future)
compliance and sustainability**

Project Drivers

Compliance

- NPDES Permitting (construction sites)
- TMDLs (6 streams for sediment, 1 for coliform)
- Surface Water Quality Standards / Erosion Control Law

Sustainability

- Training
- Natural Resources (land, water, critters)

Solution – 5 parts

- Conventional stream monitoring (RBP)
- TMDL stream segment monitoring
- Visual observation + turbidity monitoring
- Computer modeling support
- Stream geomorphic assessment

Solution (Part 1) - Conventional Monitoring

Locations: Installation divided into 30 small watersheds
Total of 35 stations (most outlets, some inlets + reference)

Parameters and Frequency:

[follows Georgia bioassessment protocol-USEPA RBP]

<u>Metric</u>	<u>Frequency</u>
Meteorological	5/yr (3 dry, 2 wet)
water chemistry	5/yr (3 dry, 2 wet)
aquatic habitat	1/yr
Macroinvertebrates or fish	1/yr
Watershed characterization (GIS)	1/yr

Solution (Part 2) - TMDL Monitoring

Locations: 6 segments (sediment); monitoring in MS4 areas

1 segment (coliform); up/inter/downstream monitoring

Parameters and Frequency:

[approved TMDL monitoring plan-GA EPD]

	<u>Metric</u>	<u>Frequency</u>
TMDL (sediment)	In-situ Turbidity	Quarterly (wet weather)
TMDL (coliform)	Coliform Bacteria	Quarterly (shared with Columbus Water Works)

Solution (Part 3) - Visual Observation Monitoring

Locations: downstream of construction sites where roads cross streams

Parameters and Frequency:

[Georgia turbidity standard based on *substantial visual contrast*]

Metric

In-situ Turbidity (streams)

Frequency

1/month

Solution (Part 4) - Computer Modeling

BASINS Computer Model

- Integrated GIS, data analysis, and landscape hydrology model
- Developed by USEPA
- Adapted for military use at Fort Benning

Value:

- Scenario testing - simulating erosion and sedimentation effects from construction and training
- Important to compliance (water quality standards and TMDLs)
- Important to sustainability (reducing erosion)

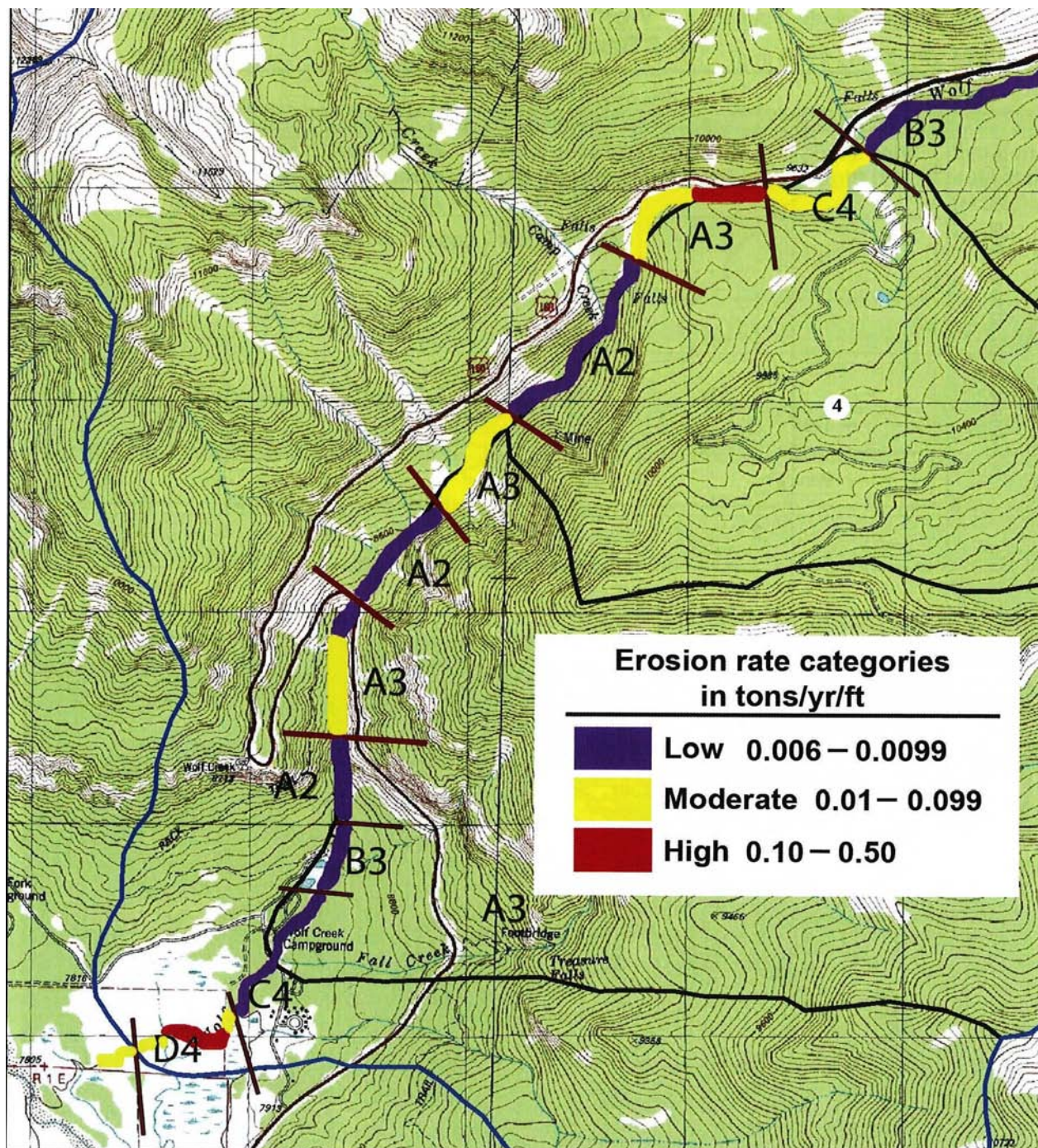
Solution (Part 5) – Geomorphic Assessment

Protocol: Watershed assessment of sediment supply (Rosgen,2006)

Approved by USEPA

5 phase installation-wide assessment (one-time only)

Phase	Results
1	Screening-level stream stability GIS layer
2	Identifies high sediment production stream segments
3	Ranks high sediment production segments (low-high risk)
4	Quantifies sediment production for segments
5	Confirmation / calibration of sediment production quantities



Source: Rosgen, 2006, WARSSS

This illustration is a simulation, not an actual map of Fort Benning.

Cost Estimate

Monitoring Component	Resource Requirement (FTE) and Cost (\$)	
	FTE	\$
Annual Recurring Costs		
Conventional monitoring	2	57,000
TMDL monitoring	1	1000
Visual observation monitoring	0.1	---
Computer modeling	0.1	4,000
Total (FTE) and (\$)	3.2	62,000
One-Time Costs (200,000 acres)		
Geomorphic Assessment	Phase 1 --	60,000--81,000
	Phase 2 --	15,000--20,000
	Phase 3 --	80,000--120,000
	Phase 4 --	250,000--300,000
	Phase 5 --	250,000--300,000
Total (\$)		665,000--821,000

Questions